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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
HU, SHOUXIANG	

ART UNIT	PAPER NUMBER
2811	

DATE MAILED: 03/04/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/940,575	DEN, TOHRU	
	Examiner	Art Unit	
	Shouxiang Hu	2811	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 December 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-13* is/are pending in the application.

4a) Of the above claim(s) *9 and 12* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8,10,11 and 13* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *18 December 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Pending and Active Claims

1. In view of the previous Office action, claim 1-13 are pending in this application; and claims 1-8, 10-11 and 13 remain active in this Office action.

Drawings

2. The new corrected drawing filed on 12-18-03 has been approved.

Claim Objections

3. Claims 1-8, 10-11 and 13 are objected to because of the following informalities and/or defects:

4. Claim 1 recites first and second groups of pores, but fails to clarify their positional relationship.

5. In claims 3 and 4, it is noted that it is the filling material in the pore, not the pore itself, that can intercept the magnetic field.

Claim Rejections - 35 USC § 112

6. The foilowing is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

7. Claims 1-8, 10-11 and 13, insofar as being supported by the elected species, are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

8. Full support cannot be found in the original disclosure for the subject matters of the limitations that the conductive material of two pores of the second group of pores serves as a writing wire for writing into the magnetic layers in one pore of the first group of pores, as recited in claim 1. The original disclosure lacks an adequate description regarding: how the two pores are identified from the second group of pores; and how they are connected and addressed from the second group of pores to form a writing wire; which one in the first group of pores is identified for writing into the magnetic layer thereinto.

9. In addition, such added new limitations can also be interpreted as meaning: only two from the second group of pores form a writing wire (instead of all together in the second group of pores), and that the writing wire can write into the magnetic layers in an identified one individually from the first group of pores (instead of all of the first group of pores simultaneously), which each are not readable on the instant invention according to the original disclosure.

10. The original disclosure also lacks an adequate description regarding: how the honeycomb (claims 7 and 8) or rectangular (claims 10 and 11) arrangement are formed,

when a group of pores are formed together as the writing wire (as shown in Fig. 3A, in which the pores are formed randomly).

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

12. Claims 1-8, 10-11 and 13, insofar as being in compliance with 35 U.S.C. 112 and as being best understood in view of the claim objections above, are rejected under 35 U.S.C. 103(a) as being unpatentable over Iwasaki et al. ("Iwasaki"; JP 2000-31462; 01/28/2000; also see US 6,278,231, of record, for its English translation) in view of Prinz (US 5,541,868).

Iwasaki discloses a magnetic device (see Figs. 16 and col. 23, lines 15-51, in US 6,278,231), comprising: a membrane layer (13; alumina) having cut-through fine pores; wirings on both faces of the membrane layer; and a substrate (82), wherein, since each of the pores is filled with a Co-Cu GMR layered column which is inherently conductive, the fine pores in Fig. 16 of Iwasaki inherently includes a first group of pores filled with a layered column formed of stacking Co/Cu layers, and a second group of pores filled with a conductive column adjacent to the first group of pores, wherein each of the second group pores can be regarded as being surrounded by a given sets of the first group pores.

Iwasaki does not expressly disclose that the conductive column in the second group of pores can be used as a writing wire for writing magnetization configurations into the magnetic layers in the nearby first group of pores. However, one of ordinary skill in the art would readily recognize that magnetization configurations in magnetic layers nearby a conductive column can be readily written with reduced adverse cross-talk by passing a writing current through the conductive column, as evidenced in Prinz (see Figs. 9 and 10, and col. 2, lies 33-37). In Figs. 9 and 10, Prinz teaches to form a magnetic device by forming a conductive column (912) in a pore as a writing wire for writing magnetization configurations into the nearby magnetic layer (909).

Therefore, it would have been obvious for one of ordinary skill in the art at the time of the invention to make the magnetic device of Iwasaki with at least one of the conductive columns being used as a writing wire for writing magnetization configurations into the adjacent magnetic layers in the surrounding pores, as taught in Prinz, so that a magnetic layer with reduced adverse cross-talk would be obtained.

Regarding claims 3 and 4, it is noted that the pores that are adjacent to the above first and second group of pores can be regarded as a third group of pores in which the magnetic layers can inherently function to intercept a magnetic field surrounding a unit cell, since at least some of the magnetic layers in a GMR element normally have a relatively lower coercivity and thus can function as a magnetic shielding material.

Regarding claim 7, the pores in Iwasaki are naturally arranged in a honeycomb arrangement (see Fig. 21C).

Regarding claims 10 and 11, it is noted that one of ordinary skill in the art would readily recognize that the individual GMR elements (or the layered columns) can also be arranged in a rectangular array with a square arrangement, as the writing magnetic filed generated from the central writing wire (as the one in Prinz) still has a same writing strength for the square-arranged adjacent GMR elements.

Regarding claim 13, the diameter of the pore in Iwasaki can be a value such as 160nm (see col. 1, lines 51-59) and the thickness of the alumina layer therein can be about 500nm (see col. 20, lines 64-65, and col. 27, lines 16), which would inherently result in an L/S ratio of about $2.5x10^5$.

Response to Arguments

13. Applicant's arguments filed on 12/18/03 have been fully considered but they are not persuasive. Examiner's response to these arguments have been fully incorporated into the claims rejections set forth in this office action, especially the claim rejections under 35 U.S.C. 112.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shouxiang Hu whose telephone number is 571-272-1654. The examiner can normally be reached on Monday through Thursday, 7:30 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie C. Lee can be reached on 571-272-1732. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SH
February 26, 2004

SHOUXIANG HU
PRIMARY EX